ISSN 0228-4111

NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY
55 Centre St., London, Ontario N6J 1T4
(519) 675-7742; Fax: 675-7777

March & April 1999

99-3 & 99-4

☺☺☺☺☺☺ *HOT NEWS FLASH* ☺☺☺☺☺☺

The newest member of the OAS has arrived!!! Fionntan Ian Greg Ferris was born, after much excitement, Friday, August 13th at 6:16 am. He is being groomed to take over KEWA editing duties immediately.

✣✣✣✣✣

WELCOME BACK TO SPEAKER'S NIGHT!

After a hectic summer in the field, it is time to renew old acquaintances. How better than to attend the September 9th Speaker's Night? The first speaker for the fall session will be Phil Woodley of New Directions Archaeology. His talk is entitled "*The Fowler Site: A Paleo-Indian Holcombe Component from Simcoe County, Ontario*".

******

As always, our meeting will be held at 8 pm at the London Museum of Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

MEMBERSHIP DUES REMINDER!!

THIS IS THE LAST ISSUE FOR THOSE WHO HAVE NOT PAID 1999 DUES.

Chapter Executive

ANNUAL RATES

Individual................	$18.00
Student....................	$15.00
Institutional............	$21.00
Subscriber...............	$20.00

President
Chris Ellis (858-9852)
515-1510 Richmond St. N N6G 4V2

Vice-President
Neal Ferris (432-2165)
451 Tecumseh St. E. N6C 1T6

Directors
Christine Nelson (438-4898)
22 Peter Street. N6B 3A2

Secretary
Karen Mattila (672-6523)
26 McMahen, N5Y3A2

Treasurer
Harri Mattila (672-6523)
26 McMahen, N5Y 3A2

Editors
Christopher Ellis (858-9852)
cjellis@julian.uwo.ca
Christine Dodd (434-8853)
dpoulton@webgate.net

The Greg Tarry Site (AeHf-38)
A Small Uren Sub-Stage Camp in Aylmer, Ontario

Jim Wilson

INTRODUCTION

The Greg Tarry site (AeHf-38) was discovered during the Stage 2 archaeological assessment of the proposed Bradley Park Subdivision during October 1996 (Mayer Heritage Consultants Inc. 1996). The site is located on the northern edge of the Norfolk Sand Plain, approximately 100 metres north of Bradley Creek; a tributary of Catfish Creek (Figure 1). It is situated on a level area, with a four metre high sand knoll located 70 meters to the north and west. At the time the site was recognized, 17 pieces of Onondaga chert waste flakes were recovered from a 15 x 15 metre area. Subsequent Stage 3 investigation involved the hand excavation of twelve one-metre square test units. The highest artifact recovery rate from any of the test units was 11, although 13 very small ceramic sherds were recovered during the course of the testing (MHCI 1996:11).

At the time Mayer Heritage Consultants Inc. (1996:11) suggested:

> *these few tiny ceramic fragments plus other Stage 3 data indicate with some degree of certainty that AeHf-38 is from the Late Woodland period (circa A.D. 900-1500). Based upon the absence of cord malleated ceramic exteriors, and the presence of incised lines on the one decorated sherd, there is a strong likelihood that the date of the occupation is somewhere between A.D. 1300 and 1500. The possibility exists that AeHf-38 may represent an Iroquoian cabin site, although the low recovery rate of artifacts and the absence of any posts or features in the twelve test units suggests the site may be best interpreted as a briefly occupied logistic camp.*

Mayer Heritage Consultants Inc. recommended that "because there is a reasonable probability of encountering subsurface cultural features and settlement pattern data (i.e., pits, hearths and structural post moulds) on even small, temporary Late Woodland period camps....the mechanical removal of topsoil should be monitored by a licensed archaeologist (1996:14).

In December 1997 the topsoil was stripped from a 30 x 30 metre area centered on the 1996 Stage 3 excavation, using a backhoe with a ditching bucket attachment.

RESULTS

In total six cultural features were identified during the Stage 4 investigations, including five small pits and one hearth. All six of these features were located in a five by five metre area immediately southwest of the surface artifact concentration and the Stage 3 test units (Figure 2).

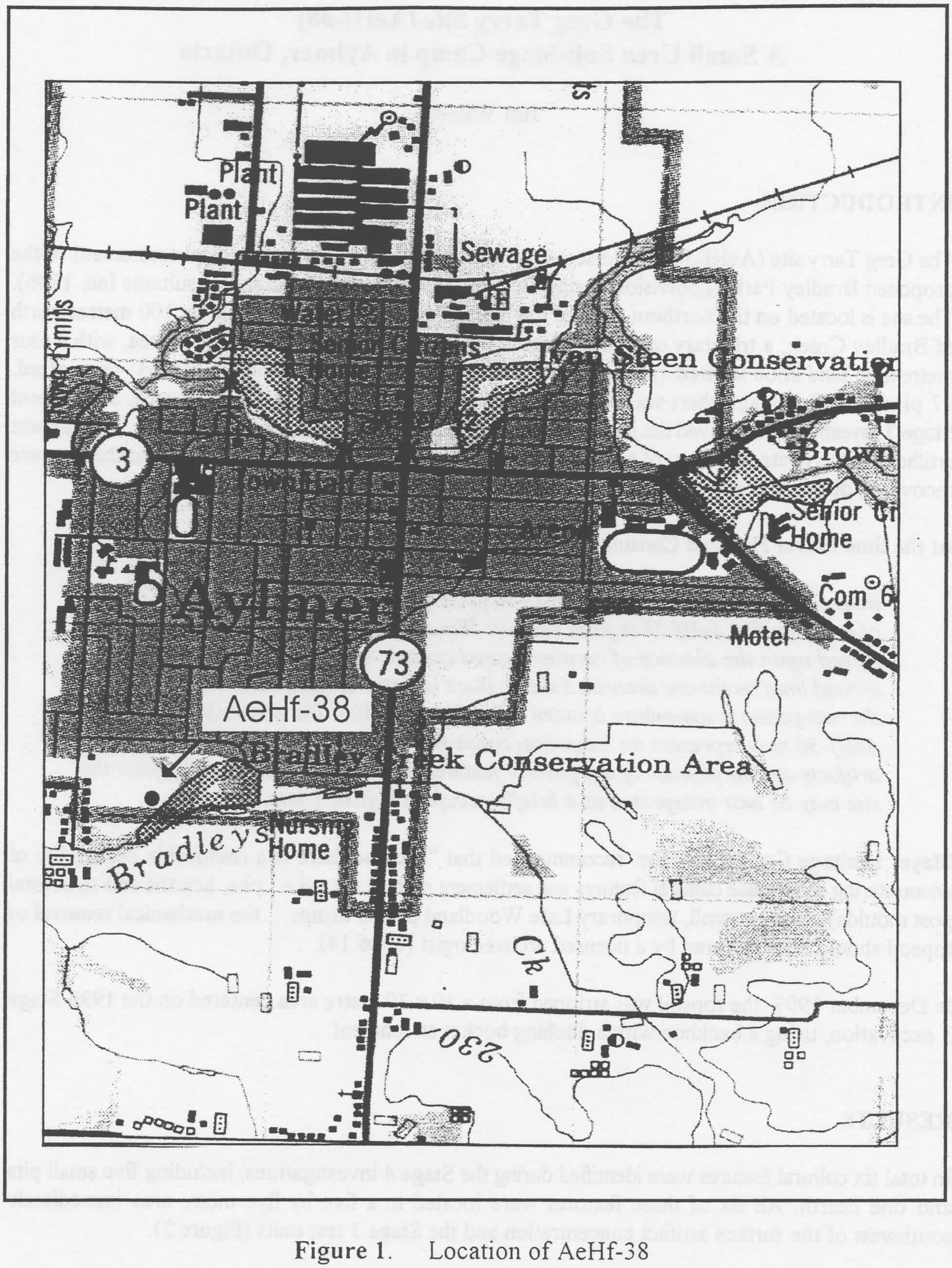


Figure 1. Location of AeHf-38

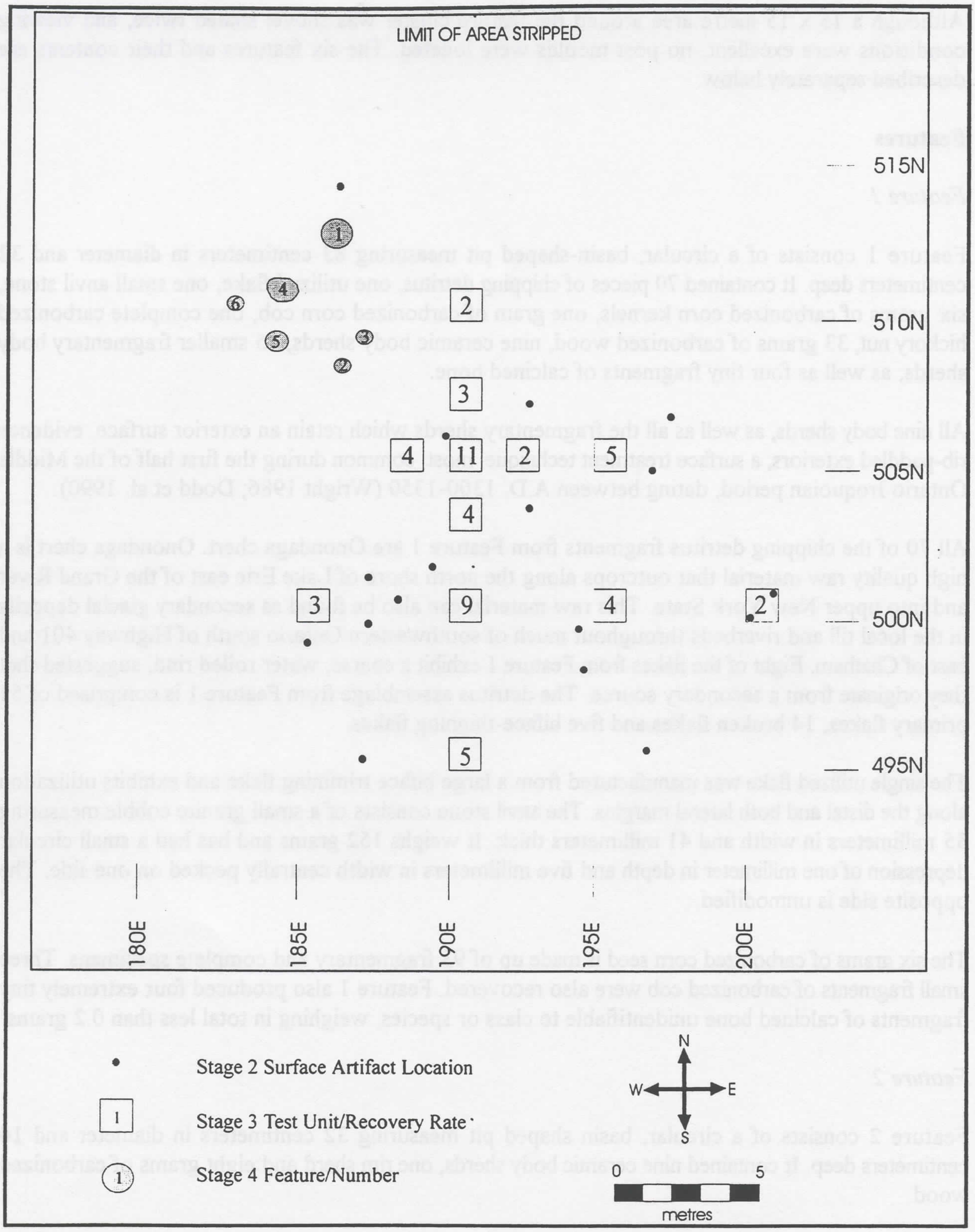


Figure 2. Location of Features in Relation to the Stage 2 and 3 Results

Although a 15 x 15 metre area around the feature cluster was shovel shined twice, and viewing conditions were excellent, no post moulds were located. The six features and their contents are described separately below.

Features

Feature 1

Feature 1 consists of a circular, basin-shaped pit measuring 83 centimeters in diameter and 32 centimeters deep. It contained 70 pieces of chipping detritus, one utilized flake, one small anvil stone, six grams of carbonized corn kernels, one gram of carbonized corn cob, one complete carbonized hickory nut, 33 grams of carbonized wood, nine ceramic body sherds, 45 smaller fragmentary body sherds, as well as four tiny fragments of calcined bone.

All nine body sherds, as well as all the fragmentary sherds which retain an exterior surface, evidence rib-paddled exteriors, a surface treatment technique most common during the first half of the Middle Ontario Iroquoian period, dating between A.D. 1300-1350 (Wright 1986; Dodd et al. 1990).

All 70 of the chipping detritus fragments from Feature 1 are Onondaga chert. Onondaga chert is a high quality raw material that outcrops along the north shore of Lake Erie east of the Grand River and into upper New York State. This raw material can also be found as secondary glacial deposits in the local till and riverbeds throughout much of southwestern Ontario south of Highway 401 and east of Chatham. Eight of the flakes from Feature 1 exhibit a coarse, water rolled rind, suggested that they originate from a secondary source. The detritus assemblage from Feature 1 is comprised of 51 primary flakes, 14 broken flakes and five biface-thinning flakes.

The single utilized flake was manufactured from a large biface trimming flake and exhibits utilization along the distal and both lateral margins. The anvil stone consists of a small granite cobble measuring 55 millimeters in width and 41 millimeters thick. It weighs 152 grams and has had a small circular depression of one millimeter in depth and five millimeters in width centrally pecked on one side. The opposite side is unmodified.

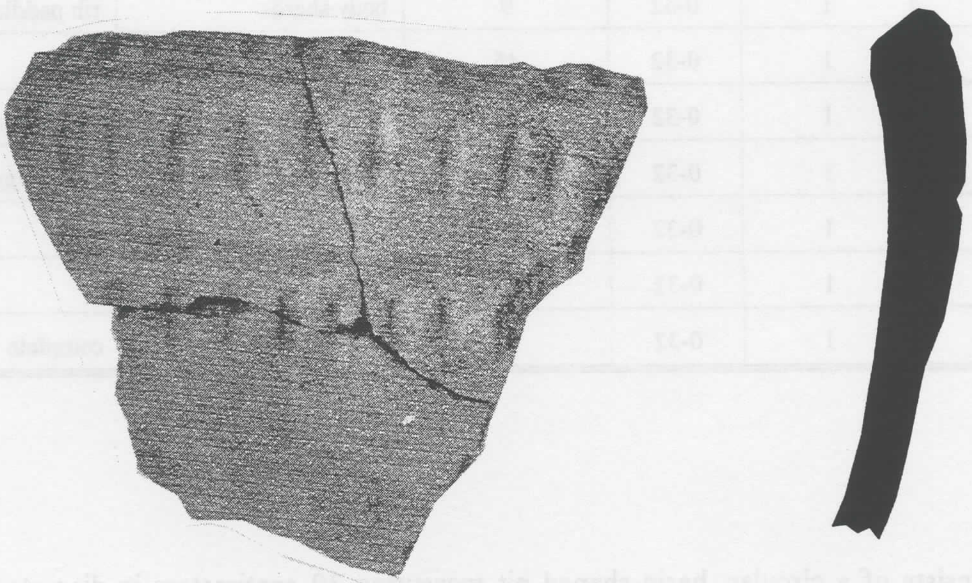
The six grams of carbonized corn seed is made up of 93 fragmentary and complete specimens. Three small fragments of carbonized cob were also recovered. Feature 1 also produced four extremely tiny fragments of calcined bone unidentifiable to class or species, weighing in total less than 0.2 grams.

Feature 2

Feature 2 consists of a circular, basin shaped pit measuring 32 centimeters in diameter and 14 centimeters deep. It contained nine ceramic body sherds, one rim sherd and eight grams of carbonized wood.

Like the sherds from Feature 1, all nine body sherds from Feature 2 have rib-paddled exteriors. The rimsherd most closely resembles the "Iroquois Linear" type described by MacNeish (1952: 18-19). The rim is 11 millimeters thick and has a poorly developed collar, which is typical of early Middle Ontario Iroquoian vessels (Figure 3). It is decorated with an encircling band of small oval stamps around the upper rim margin, over a single incised horizontal line. Beneath this incised line there is a band of vertical linear stamps. Beneath the band of vertical stamps the same tool (4 millimeters wide by 12.5 millimeters long) was used to create a single horizontal line. Beneath this line is a second row of vertical linear stamps. This second band of vertical stamps was made with a tool measuring 9.5 millimeters in length and 3.5 millimeters in wide. The body of this vessel below the decorated upper margin is rib-paddled.

The Iroquois Linear type was most common during the first half, or Uren substage of the Middle Ontario Iroquoian period (A.D. 1300-1350), although examples have been found on somewhat earlier sites as well (Lennox et al. 1986).



actual size

Figure 3. Rimsherd from Feature 2

Table 1. AeHf-38 Artifact Catalogue

CATALOGUE #	FEATURE #	DEPTH	FREQUENCY	ARTIFACT TYPE	COMMENTS
10	2	0-14	11	body sherds	rib paddled
11	2	0-14	1	rim sherd	Iroquois Linear
12	5	0-20	7	chipping detritus	burnt
13	5	0-20	46 grams	wood charcoal	
14	5	0-20	4	carbonized corn	
15	5	0-20	3	carbonized hickory nut	fragmentary
16	3	0-13	1	fired clay lump	pestle shaped
17	3	0-13	4	chipping detritus	Onondaga chert
18	6	0-14	1	carbonized corn	
19	6	0-14	7	chipping detritus	Onondaga chert
20	1	0-32	1	anvil stone	
21	1	0-32	9	body sherds	rib paddled
23	1	0-32	45	fragmentary sherds	
24	1	0-32	73	chipping detritus	Onondaga chert
25	1	0-32	1	retouched flake	Onondaga chert
26	1	0-32	36 grams	wood charcoal	
27	1	0-32	96	carbonized corn	
28	1	0-32	1	carbonized hickory nut	complete

Feature 3

Feature 3 consists of a circular, basin-shaped pit measuring 30 centimeters in diameter and 13 centimeters deep. It contained four pieces of chipping detritus and one pestle shaped lump of poorly fired clay.

The pestle shaped piece of fired clay measures 59 millimeters long, 37 millimeters wide, and weighs 65 grams. The four pieces of chipping detritus are all Onondaga chert, with two primary and two broken flakes represented.

Feature 4

Feature 4 consists of an irregularly shaped patch of fire-reddened soil centrally located among the five pit features. It measured 63 centimeters north/south by 42 east/west, and the soil oxidization extended for 3.5 centimeters into the subsoil. No artifacts were recovered from this feature and it is interpreted as a hearth.

Feature 5

Feature 5 consists of a circular, basin-shaped pit measuring 35 centimeters in diameter and 20 centimeters deep. It contained 46 grams of carbonized wood, three carbonized hickory nut fragments, four carbonized corn seed fragments, and five pieces of chipping detritus. All five pieces of chipping detritus consisted of burnt primary flakes. The three carbonized hickory nut fragments total one gram in weight and the four carbonized corn seeds together weigh 0.8 grams.

Feature 6

Feature 5 consists of a circular, basin-shaped pit measuring 29 centimeters in diameter and 14 centimeters deep. It contained one carbonized corn seed and seven pieces of chipping detritus. The chipping detritus consisted of five primary and two broken flakes, all of which were burnt.

INTERPRETATIONS

The small ceramic collection suggests strongly that the Greg Tarry site dates to the first half, or Uren sub-stage of the Middle Ontario Iroquoian period (A.D. 1300-1350). The characteristic settlement type of this period is the agricultural village, which averaged roughly one-hectare in size. It was during the Uren phase that the first true longhouses, with lengths up to 45 metres, are documented on sites in Ontario.

While a great deal has been learned over the last fifty years concerning the nature of Middle Ontario Iroquoian village life, non-village aspects of the settlement pattern have only infrequently been encountered or reported in the literature. The Willcock Site, located in west London provides a good example of a Uren cabin site. Excavations at this location uncovered a single longhouse measuring 23 x 7 metres, with three areas of rich midden deposits (Poulton 1985).

AeHf-38 is interesting in that it is neither a village nor cabin site. Rather it provides the first documented example of a small, special purpose Uren camp. This interpretation is supported by a number of different lines of evidence. First is the site's small size. In total the feature cluster covers an area of approximately 5 x 5 metres, with the entire surface scatter of artifacts measuring 15 x 20 metres. While there were five small pit features at the site, they appear to have been cooking features rather than storage features. The presence of large quantities of wood charcoal in the largest two of the features supports this interpretation. The absence of fired soil in these features probably indicates that hot coals were taken from the centrally located hearth feature and placed in the pits to facilitate roasting.

The absence of any post moulds, which if present would indicate a structure, is also convincing evidence of a brief period of utilization of the site. The limited artifact inventory, which does not include any bifacial tools or scrapers also points to a brief period of occupation.

The presence of the carbonized corn and cob fragments, as well as the carbonized hickory nut fragments, suggests that the site was probably occupied in the fall.

In conclusion, AeHf-38 provides a very valuable addition to our understanding of Uren period settlement patterns. Small sites such as these, because of their limited artifact assemblages are quite often missed, or written off without further investigation. Without the few small fragments of ceramics recovered during the Stage 3 investigations this would almost certainly have been the fate of AeHf-38. Thankfully, the quality fieldwork and reporting provided by Mayer Heritage Consultants Inc. (1996) resulted in the documentation of a very important archaeological resource.

REFERENCES CITED

Dodd, C.F., D. Poulton, P. Lennox, D.G. Smith and G.A. Warrick.
1990 The Middle Ontario Iroquoian Stage. In *The Archaeology of Southern Ontario to A.D. 1650.* Edited by C.J. Ellis and N. Ferris. Occasional Publication of the London Chapter of the Ontario Archaeological Society, No. 5, 1990:321-360.

Lennox, P.A., C.F. Dodd, and C.R. Murphy
1986 *The Wiacek Site: A Late Middleport Component in Simcoe County, Ontario*. Ontario Ministry of Transportation and Communications, Environmental Unit, Planning and Design Section, London, Ontario.

MacNeish, R.S.
1952 *Iroquois Pottery Types*. National Museum of Canada, Bulletin 124.

Mayer Heritage Consultants Inc.
1996 Archaeological Assessment (Stages 1, 2 and 3), Bradley Park Subdivision, Town of Aylmer, Elgin County Ontario. Report on file with the Ministry of Citizenship, Culture and Recreation,Toronto.

Poulton, Dana
1985 Salvage Archaeology in London: The 1983-1984 C.O.E.D. Program and the Magrath, Willcock and Pond Mills sites. Publication in Preparation, Museum of Indian Archaeology, London, Ontario.

Wright, M.J.
1986 The Uren Site AfHd-3: An Analysis and Reappraisal of the Uren Substage Type Site. *Monographs in Ontario Archaeology* 2.

Some Sites and Artifacts I have Known: The Welke-Tonkonoh Site Revisited, or What is a Meadowood Point?

Christopher Ellis

In this note, I address some issues surrounding the question of just what is a Meadowood type stone point tip by revisiting a site, Welke-Tonkonoh (AfHj-5), I studied over ten years ago. At that time I published in the **KEWA** with my colleague Dr. D. Brian Deller, and a former undergraduate student of mine at the University of Waterloo, Jacqueline Fisher, a summary description of stone artifact assemblages surface collected off of four sites on the Caradoc Sand Plain west of London (Ellis et al. 1988). These sites, all of which were discovered by Brian Deller, represented only four of over 33 Meadowood sites known as of that time on that sand plain and the immediately bordering Thames River area on the east. Of those sites, the Welke-Tonkonoh site had yielded so many points alone (Figures 1 to 3 illustrate most of the relatively complete examples from that site) that we argued that it was the best known analogue in Ontario to the very large Meadowood Phase components reported in New York state such as Scaccia (Funk 1973) or Riverhaven No. 2 (Granger 1978). Imagine my surprise to read in the recently released Volume 2 of Dr. James V. Wright's planned three volume synthesis of Canada's archaeology, that the points we reported from sites such as Welke-Tonkonoh are not Meadowood points (Wright 1999:620)! This revelation comes in a section where Dr. Wright (1999:619-621) argues that unlike New York state, there is no distinctive Early Woodland Meadowood Phase earlier and separate from the Middle Woodland assemblages in Ontario. Rather, they are largely contemporary in Ontario unlike in New York state. In short, in order to bolster this argument he attempts to discredit the presence of a distinct Meadowood Phase in Ontario by a series of what I see as *ad hoc* arguments, one of which is that several of the reported sites are not Meadowood at all. He specifically states (Wright 1999:620):

> *Many researchers however, have isolated the preform-derived tools of western Onondaga chert recovered from surface sites (Ellis et al. 1988) or mixed cultural deposits (Clermont and Chapdelaine 1982) and treated the resulting "typological" collections as evidence of a technologically 'pure' Meadowood complex. This procedure has often been further complicated by a rather loose application of projectile point typological criteria. In the case of the four 'Meadowood phase' sites in southwestern southern Ontario, for example, the thickness ranges of 'Meadowood side-notched projectile points' (Ellis et al. 1988) all extend beyond the original type description which states that such points rarely exceed 3/16" (5 mm) in thickness* (Ritchie 1961:35).

Actually 3/16th of an inch translates to only 4.76 mm thick so they are even thinner than 5 mm according to Ritchie (1961, 1971).[1]

Dr. Wright's statement is a very surprising one to me from several perspectives, two of which are notable here. For one, although I realize that experience can mean nothing, I am not a typological novice and yet, it turns out I had been classifying Meadowood points wrong for 25 years. Even more surprising, everyone I know who had examined some or all of the points from Welke-Tonkonoh, and this roster included a number of respected archaeologists with many years experience working in Ontario including of course, Brian Deller, also thought the Welke-Tonkonoh points were Meadowood forms. Other researchers such as Wilson (1997: Tables 9 and 10) have also reported Meadowood points from other sites in the same area of southwestern Ontario such as Belvoir and Pocock but since these points are also all 4.8 or more mm thick these also must not be Meadowood points. Assemblages from the Niagara Peninsula are also reported where all points exceed 5 mm but are called Meadowood so I guess that is erroneous as well (MacDonald and Steiss 1997: Table 8.2). Apparently the inability to recognize Meadowood point extends into other jurisdictions. For example, Meadowood points have been reported for Michigan by Beld (1991) but those are all also slightly thicker than 5 mm, so I guess he can not recognize a Meadowood point. Similarly, some researchers working in Quebec do not know what a Meadowood point is according to Wright. Clermont and Chapedelaine (1982: Table 14), for example, in their report on the Pointe-Du-Buisson 4 site, note that the Meadowood points there are also on average over 5 mm (5.2 mm) implying many are too thick.

Second, I also found Wright's (1999:620) conclusion surprising because Meadowood points seem to me to be a very distinctive and easily recognized type. They have much less variation than many other types reported by Ritchie (1971) and also, unlike most other types, were distinguished by a number of characteristics which make them very different from, in particular, other side-notched point forms. Just to name a few of these Meadowood characteristics:

1. the points are very well-made with what is best described flat surface flaking lacking negative deep bulbs or pronounced scars (Ritchie 1971:36);

2. the edges can have a short, abrupt marginal fore-section retouch (see especially the drawing of the type specimen in Ritchie [1971:35]) superimposed over the flat surface flaking;

3. the side-notches are small, being both relatively shallow and narrow;

4. occasionally, Meadowood points can be double notched (Ritchie 1971:35) and there is often evidence this multiple notching is produced by reworking basal ends broken in use;

5. the corners below the notches range from slightly rounded to almost pointed in plan view;

6. the notches are close to the base such that the tang below the notch ("tang height") is narrow to, on items with pointed corners, almost non-existent;

7. the base is generally straight to convex ("rocker-base"). In the Welke-Tonkonoh sample the bases were actually evenly split (i.e. 50% each; N=38) between straight and convex;

8. although bases have a general straight to convex base, it is notable that the edge itself can also be quite sinuous rather than regular in plan view (see, for example, Ritchie 1971: Plate 17 #'s 5, 8, 12) and several identical examples occur in the Welke-Tonkonoh assemblage (e.g. Figures 1d, f, k-n; 2d-e, etc.). In fact, 51.4% of the bases at that site (N=37) have such sinuous outlines and I see this trait as something very characteristic and distinctive of these points;

9. the fore-sections tend to have slightly convex to more rarely, straight lateral margins with maximum width at or near the top of the notch and overall, a generally trianguloid shape;

10. because the notches are relatively narrow and close to the base, the stem of the points, or the area below the top of the notches is somewhat short;

11. the base can be very lightly ground. At Welke-Tonkonoh 34.9% (15/38) have such grinding which seems slightly less than the "about 50%" reported by Ritchie (1971:35). However, it is possible Ritchie (1971) included items with grinding remnants only on high points of the sinuous base. In my opinion, these are remnants of platform preparation for flaking rather than purposeful dulling for other purposes and I exclude them as ground bases; and,

12. the points are thin relative to many other types and the examples from the Caradoc area sites reported in 1988 average between 5 and 6 mm – what they actually measure in New York state will be addressed below. In any case, they are much thinner than say the Middle Woodland forms referred to as "Saugeen Points" or "Chesser Side-Notched Points," etc. and would almost never be confused in this regard with such forms. Those Middle Woodland examples often average 8 to 9 mm thick with thick examples in the 10 mm range appearing to be common (for example, Wilson 1992: Appendix 2.9).

In addition to the above manufacturing and form characteristics, there is a real preference for using Onondaga cherts to manufacture Meadowood points (see, for example, Granger 1978:237-238; Ritchie 1969:183, 1971:35-36). Also, these points are often recycled into other, very distinctive forms. To be sure, other forms of Middle Woodland points, such as the weakly side-notched, much less well-made, and common "Saugeen" style of points can be recycled into forms such as scrapers and strike-a-lights. However, such recycling is very rare on reported Middle Woodland sites and more importantly, Meadowood in New York state produced a number of recycled forms which to my knowledge have never been reported in other temporal/cultural contexts. Of special note here, for example, are the small side-notched bases which have short pointed, often heavily worn, perforators at their tip, seven of which identical to the New York examples come from Welke-Tonkonoh (Figure 3k-o). Also notable are multiple notched items which are probably best described as eccentrics, and points which still retain notch remnants and yet have end scrapers or strike-a-lights at their base. Again I have never seen these items reported on definitive Middle Woodland sites but two of each form occur in the Welke-Tonkonoh collection (Figure 3p-s).

So since the Welke-Tonkonoh assemblage included many points exhibiting a large number and multiple similarities with New York forms including manufacture on Onondaga and certain distinctive frequent forms of reworking, and because such forms seem relatively easy to identify, I am surprised that anyone would question their identification and especially based on a supposed difference in a single characteristic. However, maybe I am wrong here. After all, at the Hodges site in Michigan Binford (1963), although he saw some resemblances to Meadowood sites in New York like Narwold 2, recognized three types of side-notched points which he called Hodges, Davis and Hunt but which Michigan researchers today all recognize as simply Meadowood (e.g. Beld 1991:25; Lovis and Robertson 1989:235-236). Also, Stothers and Abel (1993: Figure 6e-g) have much more recently pictured a number of side-notched forms from northwest Ohio which for some reason they call Feheeley points even though most people in my view would simply call them Meadowood if they were found in Ontario, New York or Michigan.

So perhaps the Welke-Tonkonoh points are not Meadowood at all and Dr. Wright (1999) is right. Despite the fact the points are the same in every respect as Ritchie's (1971), except being purportedly thicker, it may be that the points I have called Meadowood are a different type. Maybe therefore, they are something like Feeheley points or they should be given a different type name such as "Welke" points -- age and affiliation unknown or even the same age as Meadowood given the "thicker" items from Michigan also date to 2900 to 2400 B.P. (Beld 1991). Of course, this procedure would simply clutter up the literature with more useless types. However, perhaps there are other explanations.

Do Meadowood points, even in New York state, measure mainly under 4.76 mm as Ritchie (1971) claims? Wright seems to have a much greater faith in Ritchie's (1971:35-36) type description than I do. Despite the fact Ritchie defined Meadowood points, I have always regarded Ritchie's (1971) typology as more of a guide than a definitive statement and especially for continuous variables. After all, Ritchie does not seem to have sat down and rigorously recorded measurements on a large series of points of a particular type or at least to have reported such data. Rather, his type descriptions seem to me to be simply vague summaries in many cases. In describing the size of most types he constantly uses terms (italics mine) such as "about 15/8 to 31/2 inches long" (Ritchie 1971:35), "the majority measure between 11/4 and 13/4 inches" (Ritchie 1971:31), "measure about 1/4" of an inch in maximum thickness" (Ritchie 1971:29), "in the majority the maximum thickness is 1/4 of an inch" (Ritchie 1971:37), and so on *ad infinitum*.

Ritchie worked primarily in a time prior to the "New Archaeology" of the 1960's when replicability of observations between different observers was not a major issue and as a result, typologies were often impressionistic, very general constructs which were not based on the precise recording or reporting of data -- precision which we have learned is necessary to measure relationships between assemblages in any meaningful way. One relied more prior to that date on reputation and arguments by assertion (e.g. it is this way because I say it is this way not because I can demonstrate it) to evaluate or make a point. One can disagree with many of the excessive claims of the New Archaeology but their views on the need for following proper "ritualistic criteria" (see Dunnell

1978:196) in making arguments is certainly germane. In my view, Ritchie has contributed more to the study of the archaeology of the Northeast than any single individual but still his (1961,1971) point type descriptions are a guide rather than a detailed "bible" of those types. Maybe, just maybe, his statement that Meadowood point thickness "rarely exceeds 3/16 of an inch" is also an impression rather than based on any hard and extensive data -- if he used vague terms in referring to length, width etc. for almost every type why should he be less impressionistic for thickness of Meadowood points? Also, what does "rarely" mean in his description? One percent of the time? Ten percent of the time? Twenty percent of the time? We would be much better off if he had stated a precise percentage.

Or perhaps Ritchie (1971) only based his statement on measurements of points from a couple of atypical sites rather than measuring all available samples from sites he assigned to the Meadowood Phase. For example, maybe the points he used were only from burial sites as these predominate in the New York samples (e.g. Ritchie 1969:190-191). As grave goods the New York forms may have been especially produced by the finest of knappers or produced in slightly different finer forms as grave inclusions and be thinner than what we find on occupation sites. If this were the case then they may not be typical of all points produced by Meadowood groups during everyday activities where one must constantly cope and adapt to problems such as a knapping errors or raw material flaws. That such factors are a realistic source of variation is suggested by examining the three thickest points in the Welke-Tonkonoh sample. One (Figure 1m) has a material flaw which preluded thinning and this factor undoubtedly accounts for why it is relatively thick (7.0 mm). Examination of the other two points (7.1 and 7.6 mm; Figure 1a and 1k) reveals that except for a very small area on the fore-sections, these items are under 5.5 mm thick. They have single points of thickness which are clearly produced by a common problem in flint-knapping: that is, sometimes when a flake is removed from the edge of an item to thin it, instead of feathering out, the end of the removed flake abruptly hinges or steps out. In these cases, any attempt to remove a flake from the same edge would hinge or step out at that abrupt point precluding thinning. One way to overcome this problem and achieve the desired thinning of the area is to "sneak up" on the hinge-step by removing a flake from the opposite edge where no abrupt changes in thickness occur. In fact that is just what has happened on the items here. However, much I am sure to the knapper's chagrin, the removal from the opposite edge also hinged out, the result being a small area of much greater thickness surrounded by abrupt hinge and step flake scar terminations which can not be thinned. I have seen these points of thickness called "hinge-islands", "pigs" and several other terms.

The point is, some degree of knapping error did not allow thinning completely of the point so they are relatively thick at one point but in the context of everyday normal activities they were still serviceable. As such they may differ from assemblages on sacred sites or even from sites where there is an abundance of high quality material nearby and where maximum use of the raw material is not required. In fact, the odd point may differ for the same reasons in other respects besides thickness from a typological norm. For example, there are two points at Welke-Tonkonoh with notches which deviate somewhat from the norm (Figure 1i-j) but in both cases these points exhibit evidence the bases were broken in use and the notches are rough but serviceable ones produced on the spot to allow continued use of the items.

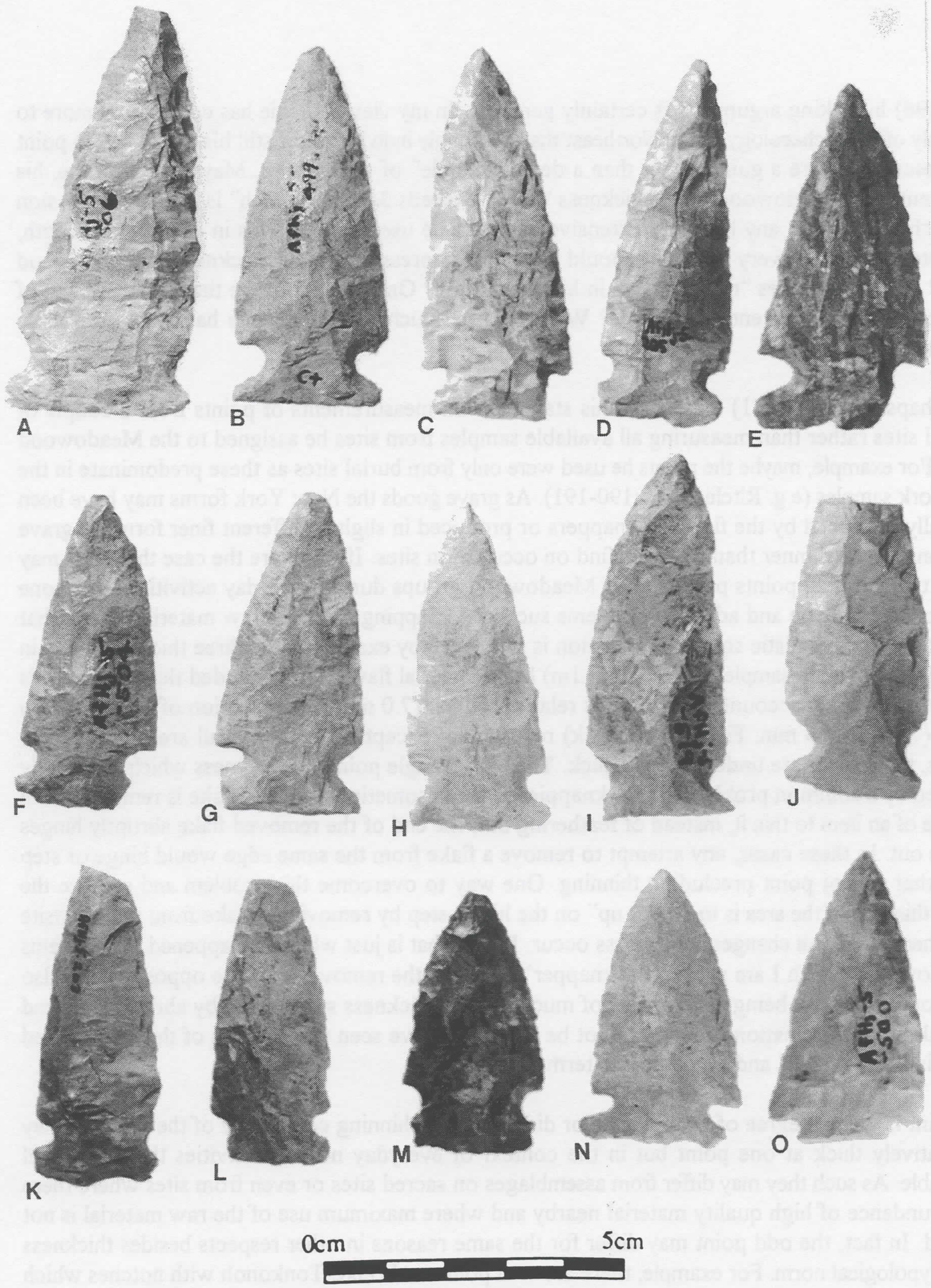


Figure 1. Meadowood Points, Welke-Tonkonoh Site.

(All are from 'Meadowood Area' at site. Specimens i-j have evidence of basal breakage and renotching. Specimen 'a' may be in process of being recycled into a drill.)

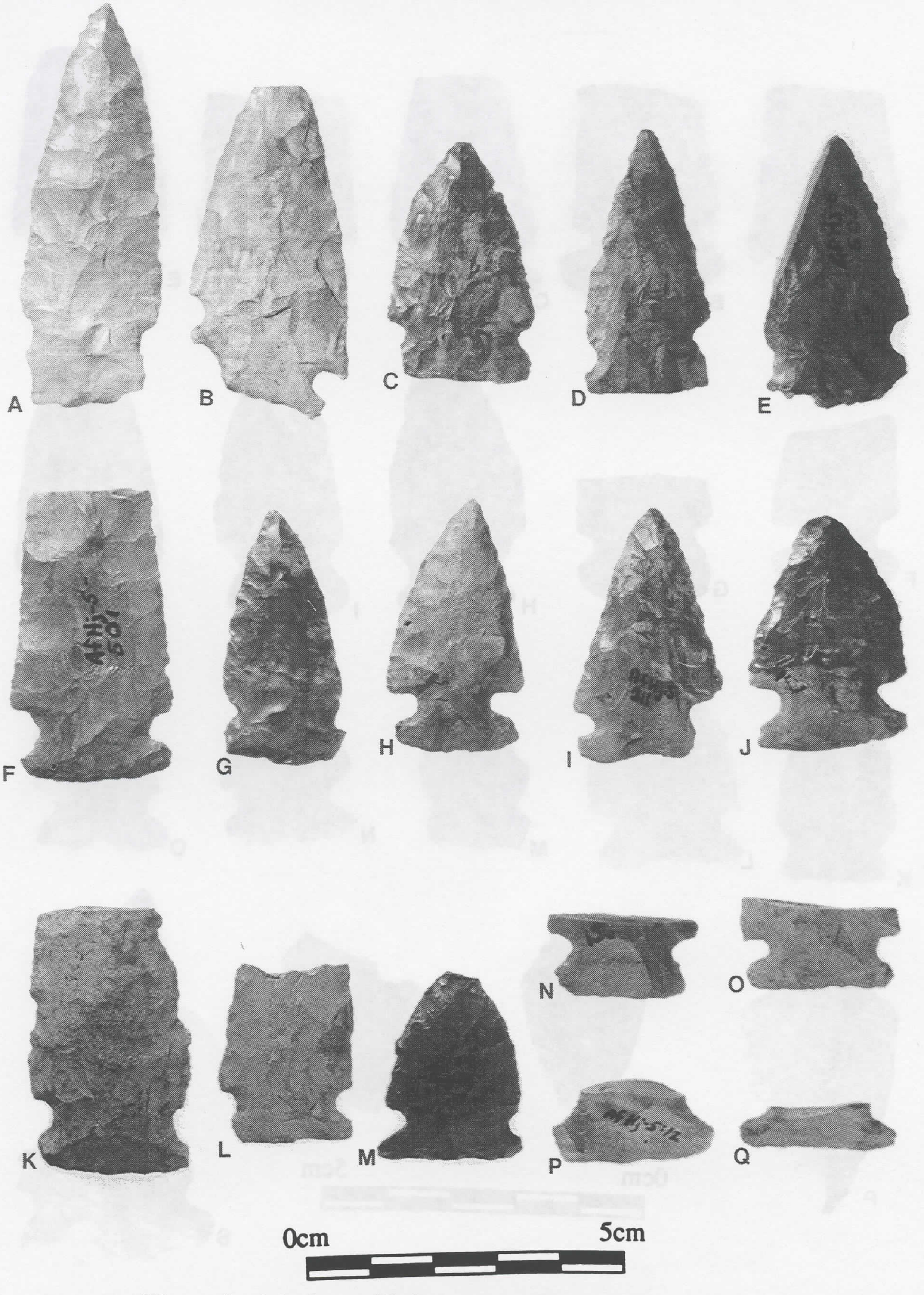


Figure 2. Meadowood Points and Bases, Welke-Tonkonoh Site.

Specimens a-b are double notched. All except p are from 'Meadowood Area.'

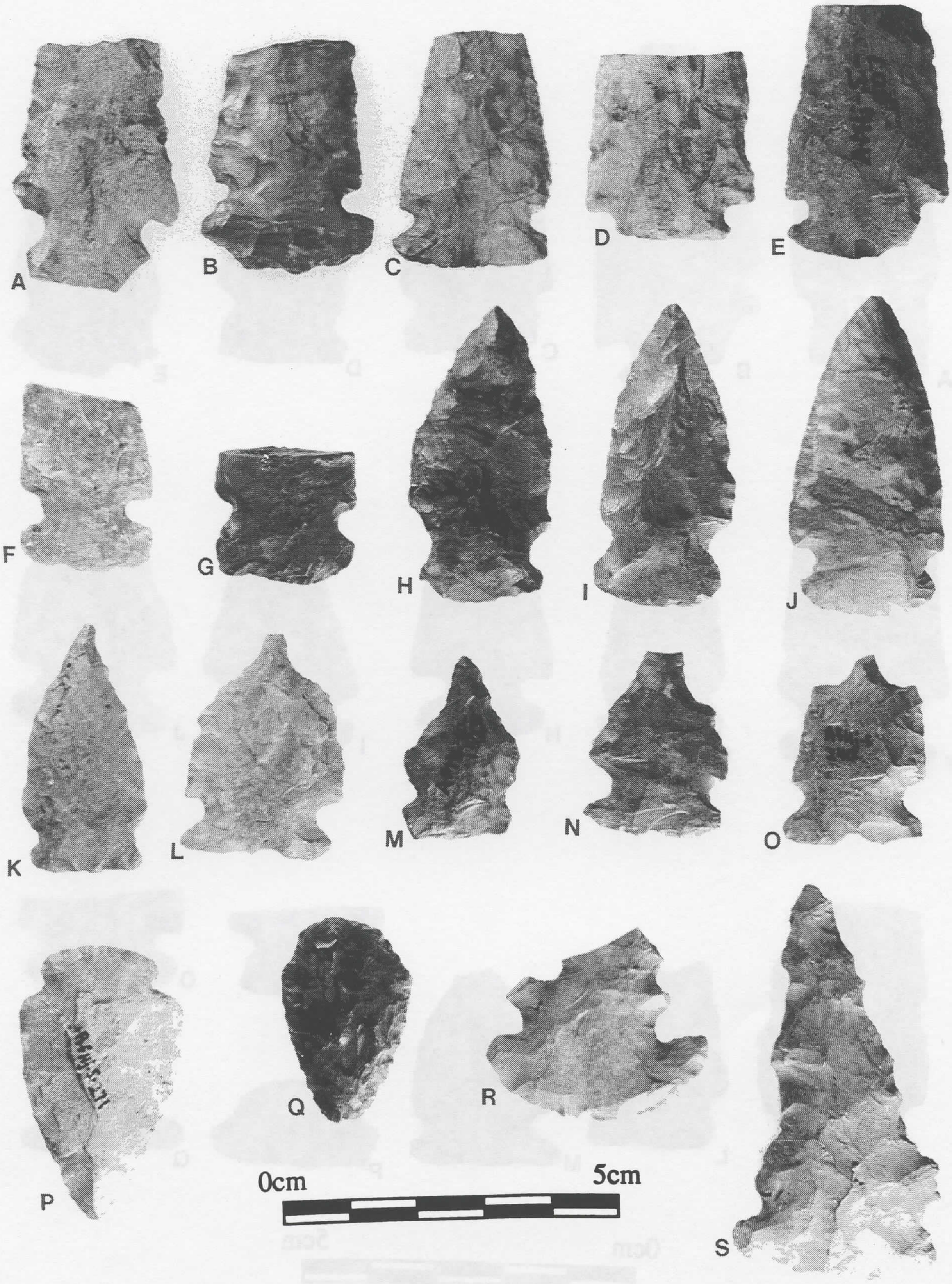


Figure 3. Meadowood Points (a-g), Meadowood-like Points (h-j), Perforators (k-o), Strike-a-Light on notched point base (p), End Scraper on notched point base (q), Eccentrics (r-s).

(All are from 'Meadowood Area' except for q-r which are from other site areas or are of unknown site area provenance.)

In any case, Ritchie did not give us the precise measurements or spell out exactly what samples were used to derive thickness estimates. Unfortunately, few others have provided a list of the exact data for each and every Meadowood point found at their site or even, precise data summaries in the form of means, standard deviations and so on which would allow one to statistically assess just how similar or different the New York point assemblages are from Ontario ones in all characteristics -- not just thickness. Our 1988 report (Ellis et al. 1988) was one of the few to have ever provided precise data summaries for a Meadowood assemblage (see also Beld 1991; MacDonald and Stiess 1997: Table 8.2; Wilson 1997). It is certainly ironic that we are singled out for not being able to recognize Meadowood points using exactly that precisely reported data and upholding a description of the type which is notable for its lack of precise reporting. Regardless, since I think this information will become increasingly important in the future, I attach to this note individual measurements compiled by Jacqueline Fisher for each relatively complete point from Welke-Tonkonoh I consider Meadowood (Appendix A). In addition, data have been added for several other points from the site which were not available for examination when the site was previously analysed -- data based on measurements done by me. These new additions mean the overall totals for the site given in 1988 for all the kinds of artifacts reported (Ellis et al. 1988: Table 1) need to be revised and the new totals are given here on Table 1. Space and time permitting, I will attach individual data on the other Caradoc Sand Plain Meadowood points in future **KEWA** issues.

Table 1. Revised Totals for Welke-Tonkonoh Meadowood Assemblage, 1999.

ARTIFACT TYPE/CLASS	**N**
Meadowood points	55 [52]
Meadowood-like points	4[4]
Large Meadowood points?	2[2]
End scrapers Type 1	2[0]
End scrapers Type 2	1[1]
End scrapers Type 3	2[1]
End scrapers Type 4	1[1]
Strike-a-lights Type 1	3[1]
Strike-a-lights Type 2	1[0]
Strike-a-lights Type 3	1[1]
Side-notched drills	2[2]
T or expanding base drills	0(7?)[0]
Perforators on side-notched point bases	7[7]
Perforators on cache blades	1[1]
Eccentrics	2[1]
Cache blades	3(18?)[3]
Recycled cache blade	1[1]
Longitudinal scraper/knife	2[1]
Adzes	2[2]
TOTALS	92(114)[81]

*all items on Onondaga chert except adzes, one Meadowood-like point, one large Meadowood point and one Type 1 end scraper. For description of end scraper, drill and other types see Ellis et al. 1988. Totals in round brackets include items which may be Meadowood but could also be associated with earlier terminal Archaic `Smallpoint' components. Totals in squared brackets includes only items from "Meadowood Area" south of creek at site (Ellis et al. 1988: Figure 2). Remaining items are from other site areas or specific provenance within site is unknown.

Data summaries of the Welke-Tonkonoh points were reported in 1988 as calculated by

Jacqueline Fisher (Ellis et al. 1988: Table 2) and are reproduced here as Table 2. However, as noted above, some new additional specimens are now available. Also, there are four points from Welke-Tonkonoh (Figure 3h-j) we classified as Meadowood in 1988 which admittedly, I always thought were only really "Meadowood-like" (i.e. they are closer to Meadowood than any other type but I do not feel completely comfortable stating they are such points) so I produce data summaries here excluding those four items but including the additional finds (Table 3). These additions and subtractions have no major effect on the data summaries reported in 1988. Most items are over 5 mm thick (only four are actually under 4.76 mm thick) and the average at the site does exceed 5 mm (5.49 mm).

Table 2. Welke-Tonkonoh Meadowood Point Metrics as Reported in 1988.

CHARACTERISTIC	N	R	MEAN	STD. DEV.
Length	14	36.6-62.1	46.86	8.951
Width	25	19.6-25.8	22.86	1.992
Thickness	27	4.2-8.0	5.67	0.973
Basal Width	18	18.7-25.8	21.62	2.258
Neck Width[1]	25	11.2-18.3	14.46	3.033
Basal Length[2]	25	7.0-12.0	9.31	1.694
Blade Length	14	26.7-53.0	37.47	8.955
Tang Width[3]	36	2.2-6.0	3.84	0.903
Notch Width	39	3.2-7.4	6	6.644
Notch Depth	40	1.5-5.0	2.73	0.711

[1]:width across notched area; [2]: length from top of notches to base; [3]: width of corners below the notch.

Lest one think I have cast unwarranted aspersions on Ritchie's (1971) typology and description, it is in fact possible to evaluate in some ways if the New York specimens themselves do conform to Ritchie's claims re: their thickness -- even if data are not as precise as one would like. Granger (1978) in his synthesis of New York Meadowood provided some information on the point samples for all the major New York sites including all the ones examined by Ritchie. Of note and germane to the arguments here, Granger (1978: Table A.1b) provides data on thickness of the points although unfortunately it is in the form of number of points per certain intervals of thickness, these intervals being 4-6 mm, 7-9 mm and so on. These data are reproduced here as Table 4 with the addition of the Welke-Tonkonoh data grouped in a similar presumed manner -- I state "presumed" as I assume Granger (1978) included items between 6 and 7 mm (e.g. 6 to 6.9) in the 4 to 6 mm interval but it may be he rounded them off. As such I include Welke-Tonkonoh data in two forms on the table, once including everything under 6.9 mm in the 4 to 6 mm range and once including rounding everything below 6.5 mm to the 4 to 6 mm range. I omit the Muskalonge Lake site reported by Granger (1978) with its corner-notched and thicker points (all over 6 mm; Ritchie 1955:34-35) which I feel are better regarded as related to terminal Archaic "Smallpoint" assemblages.

Table 3. Revised Welke-Tonkonoh Meadowood Point Metrics.

CHARACTERISTIC	N	R	MEAN	STD. DEV.	COEFFICIENT OF VARIATION
Length	16	36.6-62.1	49.13	9.755	19.855
Width	35	19.2-30.4	23.45	2.421	10.324
Thickness	37	4.2-7.6	5.49	0.779	14.189
Basal Width	24	18.7-30.4	22.50	2.539	11.284
Neck Width	38	11.5-23.4	15.93	1.900	11.927
Basal Length	34	7.0-12.9	9.54	1.724	18.071
Blade Length	17	26.7-53.0	40.29	9.351	23.209
Tang Width	54	2.2-6.9	4.00	0.977	24.425
Notch Width	51	3.2-7.5	5.01	1.128	22.515
Notch Depth	53	1.5-5.4	3.20	0.880	27.500

Table 4 Distribution of Points by Thickness Categories.[1]

INTERVAL	SINKING PONDS	RIVERHAVEN NO. 2	SCACCIA	MORROW	OBERLANDER NO. 2
4-6	20(95.2%)	48(92.3%)	25(89.3%)	9(90.0%)	7(77.8%)
7-9	1(4.8%)	4(7.7%)	3(10.7%)	1(10.0%)	2(22.2%)
10-12	-	-	-	-	-
13-15	-	-	-	-	-
Interval	Hunter	Narwold 2	Vinette	Buffalo G	Welke-Tonkonoh[2]
4-6	4(100.0%)	4(80.0%)	8(66.7%)	3(75.0%)	34(91.9%) [33(89.2%)]
7-9	-	1(20.0%)	2(16.7%)	1(25.0%)	3(8.1%) [4(10.8%)]
10-12	-	-	1(8.3%)	-	-
13-15	-	-	1(8.3%)	-	-

[1]:New York data from Granger 1978: Table A.1b; [2]: Totals in square brackets employ 6.5mm as cutoff point between 4-6 and 7-9 mm intervals.

Besides showing that Welke-Tonkonoh and the other Ontario sites do not differ using these intervals from the New York Meadowood sites in terms of thickness (and indeed, tend to be thinner than many New York sites or to have a higher percentage in the 4-6 mm range), Granger's (1978: Table A1b) data indicates he found no Meadowood points from any site thinner than 4 mm (nor did we in the Caradoc assemblages). If we took Ritchie's description of the points as only "rarely" (or almost none in Wright's view) exceeding 4.76 mm at face value, then these points wherever found would have to be almost totally in the 4 to 4.76 mm range. I doubt if there are any types in the real world where knappers achieved by secondary flaking a thickness to within 0.76 mm on the vast majority, if not all, of the items produced. This casts some doubt on Ritchie's statements about Meadowood points in New York rarely exceeding 4.76 mm or may suggest his "rarely" means much more than "never" as Wright seems to imply. It might even suggest the sample upon which Ritchie based his statements as to thickness was produced by one individual at one time. In fact, at the Scaccia site, a major Meadowood habitation site in New York reported by now retired New York state archaeologist Robert Funk (1973:108), it is reported that the Meadowood points there are only as thin as 3/16 of an inch or 4.76 mm. If in fact none are thinner than 4.76 mm at that site and we took Ritchie's (1971) statements as gospel that few exceed 4.76 mm then one would have to argue they were so skilled they could produce time and time again points of almost exactly a 4.76 mm thickness -- very impressive indeed!!! However, Funk (1973:108) does indicate the Meadowood points at Scaccia range as high as 1/4 inch thick or 6.35 mm – in short a number exceed 5 mm as they do at Welke-Tonkonoh but how many is not specified.

It is clear though according to Funk (1973) (and in a volume he co-wrote with Ritchie!) that not only do some of the points at Scaccia exceed 4.76 mm but in fact all do which directly contradicts Ritchie (1961, 1971). Also, Ritchie (1955:34) himself reported only two points from the Hunter (Red Lake) site and states that both were over 4.76 mm (5 and 6.5 mm respectively). Granger's (1978: Table A1b) data itself indicate from 4.8% to 33.0% of the points from the New York sites are actually over 7 mm thick. Given the number of items over 7 mm thick from certain sites, one strongly suspects that of the remainder of the points from those sites grouped at 4 to 6 mm includes several more examples which are greater than 4.76 mm thick. In fact, Granger (1978:211) states that at the Riverhaven #2 site, the Meadowood points averaged 5 mm thick or above the measure which Ritchie (1971:34) stated was rarely exceeded (4.76 mm). Indeed, since only 4 of the 52 Riverhaven points were placed in the 7 to 9 mm range, many of those 48 points grouped by Granger (1978:Table A1b) in the 4-6 mm range must have exceed 4.76 mm in order for the mean of the whole sample to be 5 mm.

So we actually have several sites in New York where many if not most of the points exceed the type definition in thickness. Yet, they are recognized as Meadowood sites and points by Ritchie who initially defined the type, as well as other New York experts like Granger and Funk. Indeed, I can find no site assemblages from New York which definitely conform to the thickness description presented by Ritchie in 1961 and again in 1971. In short, the New York Meadowood points seem no different than the Welke-Tonkonoh assemblage. It may be that the "rather loose application of projectile point typological criteria" (Wright 1999:620) applies to all the New York researchers including Ritchie (1961, 1971). Or maybe Wright (1999:622-625) himself is guilty of a "rather loose application of typological criteria" since he constantly refers to Scaccia and other sites like Riverhaven in New York as Meadowood sites? For that matter, and here is what is especially surprising, the Meadowood points reported by Wright himself from the Bastican site in Quebec (Levesque et al. 1964:33) are said to range from 4 to 6 mm with a mean of 5.4 mm!!!

Overall, for Dr. Wright's (1999:620) assertion to be true, we have found not only that many researchers in Ontario, Quebec and Michigan can not recognize a Meadowood point, but apparently Ritchie, Granger, Funk and others in New York can not either. Nor can Dr. Wright himself recognize a Meadowood point since he accepts the items from Hunter, Scaccia and Bastican as Meadowood. Given these facts, we could decry the state of Great Lakes typology in general, its practitioners and those who taught them. More realistically, we could face up to the fact that the vast majority of those working in southwestern Ontario (and Michigan and New York and Quebec) on archaeological assemblages actually do know something about: 1) what types are; 2) how they are recognized; and 3) what constitutes a Meadowood point. These conclusions do not mean we do not need much more detailed characterizations of what constitutes various point types. These are necessary in order to more unambiguously recognize types and are certainly preferable to relying solely on outmoded and impressionistic descriptions of continuous variables such as Ritchie's (1971). Those descriptions served their purpose in their time but they now need to be improved by exact data reporting if we are to advance our understanding of the age and cultural relationships of Early Woodland or for that manner, any archaeological assemblage. This procedure is exactly what we followed in 1988.

To sum up, there is clearly no discernible difference between the New York and Ontario Meadowood points in terms of thickness or the many other characteristics I enumerated earlier. The only reason Dr. Wright (1999) rejects the Ontario Meadowood points but accepts the New York ones seems to be they do not fit his preconceived notions of Ontario Early and Middle Woodland culture history. Even though the Welke-Tonkonoh site has only been surface collected, and despite his claims to the contrary, it still has yielded more Meadowood points, Meadowood perforators, etc. than almost every reported site, including all the extensively excavated New York sites. This evidence suggest it represents an actual Meadowood Phase occupation. Why should a non-Meadowood Phase site have more examples of these points and other artifacts than a Meadowood Phase one?

Acknowledgments: I extend my sincere thanks to Brian Deller for allowing me access to the Welke-Tonkonoh Meadowood assemblage and Neal Ferris and Mike Spence for some advice on this paper.

REFERENCES CITED

Beld, S. G.
1991 *Two Terminal Archaic/Early Woodland Sites in Central Michigan*. Museum of Anthropology, University of Michigan, Technical Report No. 22.

Binford, L. R.
1963 The Hodges Site: A Late Archaic Burial Station. In *Miscellaneous Studies in Typology and Classification* by A. White, L. Binford and M. Papworth, pp. 124-147. Anthropological Papers, Museum of Anthropology, University of Michigan No. 19.

Clermont, N and C. Chapdelaine
1982 *Pointe De Buisson 4: Quarante Siècles D'Archives Oubliées*. Recherches Amérindiennes au Québec, Montreal.

Dunnell, R. C.
1978 Style and Function: A Fundamental Dichotomy. *American Antiquity* 43:192-202.

Ellis, C. J.
1980 Investigations of a Transitional Paleo-Indian to Archaic Lithic Industry in Southwestern Ontario. Ontario Archaeological Licence Report on file, Licence 8-0-F-0376, Ministry of Citizenship, Culture and Recreation, Toronto, Ontario.

Ellis, C. J., J. A. Fisher and D. B. Deller
1988 Four Meadowood Phase Lithic Artifact Assemblages from Caradoc and Delaware Townships, Southwestern Ontario. *KEWA* 88(8):3-20.

Funk, R. E.
1973 The Scaccia Site. In *Aboriginal Settlement Patterns in the Northeast* by W. A Ritchie and R. Funk, pp. 99-116. New York State Museum and Science Service, Memoir 20.

Granger, J. E.
1978 *Meadowood Phase Settlement Pattern in the Niagara Frontier Region of New York State*. Anthropological Papers, Museum of Anthropology, University of Michigan No. 65.

Levesque, R., F. Osborne and J. V. Wright
1964 *Le Gisement de Bastican*. Études Anthropologiques Musée National du Canada No. 6.

Lovis, W. A and J. Robertson

1989 Rethinking the Archaic Chronology of the Saginaw Valley, Michigan. ***Midcontinental Journal of Archaeology*** 14:226-260.

MacDonald, R. I. and D. Stiess

1997 Formal Tool Analysis. In ***In the Shadow of the Bridge, The Archaeology of the Peace Bridge Site (AfGr-9), 1994-1996 Investigations***, edited by R. F. Williamson and R. I. MacDonald, pp.323-332. Occasional Publications of Archaeological Services Inc., Volume 1.

Ritchie, W. A.

1955 ***Recent Discoveries Suggesting an Early Woodland Burial Cult in the Northeast***. New York State Museum and Science Service, Circular 40.

1961 ***Typology and Nomenclature for New York Projectile Points***. New York State Museum and Science Service, Bulletin 384.

1969 ***The Archaeology of New York State***. Revised Edition. Natural History Press, New York.

1971 ***A Typology and Nomenclature for New York Projectile Points.*** Revised Edition. New York State Museum and Science Service, Bulletin 384.

Stothers, D. and T. Abel

1993 Archaeological Reflections of the Late Archaic and Early Woodland Time Periods in the Western Lake Erie Region. ***Archaeology of Eastern North America*** 21:25-109.

Wilson, J.A.

1992 The Boresma Site: A Middle Woodland Base Camp in the Thames River Valley. M.A. Thesis, Department of Anthropology, McMaster University, Hamilton, Ontario.

1997 The Middle Thames River Settlement/Subsistence Project, Middlesex County, Ontario. Ontario Archaeological Licence Report on file, Licences 92-060 and 93-053, Ministry of Citizenship, Culture and Recreation, Toronto, Ontario.

Wright, J. V.

1999 ***A History of the Native People of Canada Volume II (1,000 B.C. - A.D. 500)***. Canadian Museum of Civilization, Archaeological Survey of Canada, Mercury Series Paper 152.

Footnote

[1]: I do not deny that the Welke-Tonokonoh site Meadowood assemblage was isolated from a surface-collection from a multi-component site. However, most of the Meadowood materials (including 52 of the 55 points, all the hafted perforators, etc.) were from a ca. 125 by 100 metre elevated area (called the "Meadowood area"; Ellis 1980; Ellis et al. 1988: Figure 2) south of a stream which cross-cuts the site (see Table 1). If these are not a "technologically 'pure' assemblage" as Dr. Wright (199:620) suggests, this view of course begs the question of what other material from the Meadowood area is associated with the points. There are no known ceramics from that site area. The Meadowood items surely can not be associated with, for example, the eleven Hi-Lo points, three bifurcate-based points, six Otter Creek points, five bannerstones, six Jack's Reef points, etc. from the same site area. The only material from the area which seems remotely in age to be close to Meadowood include a single Adena point, a single possible Kramer point, a Snyder's Corner-Notched point, and three and possibly four "Saugeen" style side-notched points. If it is not a "technologically 'pure' assemblage" it is still very close to it. It is much easier (and parsimony does mean something) to see the site as a Meadowood Phase one with traces of other occupations than as something grafted onto a distinct local development of some unknown form. It is also worth stressing that the vast majority of reported New York sites, excepting most cemeteries, seem to be multi-component as well (e.g. Funk 1973:114-115, 1976:29-42; Granger 1978:212). Yet, for some reason Wright (1999) does not question the integrity of those sites.

Appendix A Measurements of Individual Points, Welke-Tonkonoh Site.

FC#	LENGTH	BLADE LENGTH	BASE LENGTH	BASAL WIDTH	WIDTH	THICKNESS	NECK WIDTH	TANG LENGTH LEFT	TANG LENGTH RIGHT	NOTCH WIDTH LEFT	NOTCH WIDTH RIGHT	NOTCH DEPTH LEFT	NOTCH DEPTH RIGHT
12	-	-	-	25.20	-	-	17.1	-	5.60	5.10	-	-	-
44	-	-	10.00	-	25.00	5.30	14.1	-	-	-	-	-	-
54	-	-	-	24.70	-	-	16.1	4.00	4.00	-	-	-	-
107	-	-	-	21.00	-	-	15.9	6.90	6.10	-	-	-	-
201	-	-	11.10	22.80	24.10	6.80	15.0	4.00	3.40	7.40	7.00	2.60	5.00
202	55.0	45.10	9.90	23.70	23.70	5.00	16.9	3.30	3.60	5.00	5.00	3.10	3.00
203	-	-	7.30	21.10	21.10	7.00	15.3	4.80	5.00	4.50	4.20	3.00	2.10
204	62.1	50.00	12.00	18.70	21.80	5.10	16.6	-	-	4.50	4.80	2.20	2.00
205	60.0	52.00	8.00	21.30	21.90	5.90	15.5	5.10	4.50	4.30	4.00	2.20	2.90
206	46.0	38.00	8.00	21.30	25.70	6.00	16.7	4.00	3.60	3.90	3.70	4.40	5.20
207	44.0	33.00	11.00	-	23.50	5.30	16.7	4.50	-	5.20	-	2.80	2.30
209	-	-	-	-	25.40	5.00	-	3.50	-	4.00	-	4.00	-
210	60.3	53.00	7.30	-	25.40	5.60	16.6	3.30	-	4.00	-	3.50	-
211	39.0	31.00	8.00	-	23.50	5.60	14.9	3.20	-	4.00	-	2.80	-
212	39.0	30.20	8.70	-	19.20	4.20	15.3	-	-	-	-	-	-
213	-	-	7.50	-	20.00	6.00	13.5	4.40	-	4.10	-	2.30	-
218	36.7	28.60	8.00	-	23.00	4.60	17.6	3.30	4.00	4.00	-	2.00	-
219	-	-	11.00	23.00	25.00	4.50	18.5	4.80	3.70	5.40	5.60	3.00	2.30
221	-	-	7.10	-	21.10	5.00	15.5	3.10	-	4.80	-	2.60	-
222	-	-	-	-	19.50	5.30	15.9	-	-	-	-	-	-
223	-	-	10.30	19.90	20.00	5.00	12.4	5.00	6.00	5.30	4.10	3.10	3.60
224	-	-	7.10	22.70	22.70	6.00	16.9	2.30	4.00	4.00	3.80	2.20	2.80
248	36.6	26.70	9.80	-	25.80	5.00	15.2	3.20	-	5.80	6.70	4.10	4.00
256	-	-	7.00	22.80	22.80	5.20	16.2	3.00	2.20	5.30	3.20	1.50	3.20
270	40.8	31.90	9.00	19.20	19.60	5.00	15.4	4.80	3.10	5.00	4.70	2.80	2.00

FC#	LENGTH	BLADE LENGTH	BASE LENGTH	BASAL WIDTH	WIDTH	THICKNESS	NECK WIDTH	TANG LENGTH LEFT	TANG LENGTH RIGHT	NOTCH WIDTH LEFT	NOTCH WIDTH RIGHT	NOTCH DEPTH LEFT	NOTCH DEPTH RIGHT
273	39.6	31.60	9.00	19.40	21.50	6.00	11.5	3.40	3.40	4.30	3.50	4.00	5.40
301	-	-	12.00	25.80	25.80	5.00	16.7	4.00	5.00	4.20	-	3.00	3.00
306	-	-	11.10	20.80	21.30	5.80	15.9	6.00	3.50	4.60	5.00	2.50	2.80
434	-	-	-	-	25.30	6.50	-	-	-	-	-	-	-
499	58.3	49.40	8.90	24.60	25.40	5.90	14.6	3.40	2.70	6.40	-	5.10	-
500	-	47.00	-	-	26.00	4.30	15.3	-	-	-	-	-	-
501	-	-	11.50	23.50	25.30	5.10	16.8	3.80	-	5.20	-	4.00	3.90
502	-	-	9.60	-	24.70	5.80	15.8	3.00	-	7.20	-	3.60	-
503	-	-	12.40	22.10	-	4.80	18.3	3.50	-	6.20	-	2.60	-
504	51.7	41.00	10.10	-	22.20	5.70	14.2	3.30	-	5.20	-	3.90	-
506	-	-	12.90	30.40	30.40	7.10	23.4	3.60	4.30	6.90	7.30	3.20	3.80
507	-	-	8.00	-	24.80	5.00	16.7	2.60	-	3.70	-	3.90	-
508	-	-	9.80	20.70	-	-	15.8	3.90	4.10	6.10	4.70	3.30	2.80
509	-	-	8.70	23.10	24.80	5.10	16.6	3.80	3.90	4.50	4.40	4.00	3.50
516	-	-	-	-	-	-	13.8	4.90	-	-	-	-	-
518	57.0	45.60	11.40	-	-	5.00	-	-	-	-	-	-	-
519	59.9	50.90	10.90	22.30	23.60	7.60	-	-	-	7.50	6.40	3.50	3.10
215*	41.0	32.00	9.00	17.50	18.60	7.00	14.3	3.30	-	6.00	-	2.20	-
268*	45.0	33.80	11.30	19.00	20.00	6.80	14.2	5.00	4.00	5.80	5.80	2.20	2.00
269*	44.0	33.00	10.80	18.70	21.00	8.00	14.3	3.00	-	5.90	4.80	2.30	2.00
283*	47.5	38.00	9.40	20.10	23.40	7.90	16.9	3.80	3.10	5.00	4.90	2.10	2.20

*asterisked items are "Meadowood-like" and are not included in the data summaries on Table 3.